Claims

1. Reactive polymers and copolymers based on *N*-(2-hydroxypropyl)methacrylamide for preparation of polymeric drugs, modification of biologically active proteins and preparation of gene delivery systems characterized in that they contain reactive thiazolidine-2-thione groups.

2. Reactive polymers and copolymers according to Claim 1 characterized in that they contain reactive thiazolidine-2-thione groups in side chains of the polymers or copolymers.

3. Reactive polymers and copolymers according to Claim 1 characterized in that they contain reactive thiazolidine-2-thione groups at the ends of polymer chains.

4. Reactive copolymers according to Claim 2, characterized in that they consist of 30 - 3000 monomer units linked in a polymer chain, out of which 60 – 99.8 % are *N*-(2-hydroxypropyl)methacrylamide units and 0.2 - 40 % are reactive monomer units based on *N*-methacryloylated amino acids or oligopeptides containing reactive thiazolidine-2-thione groups of the general formula Ma-X-TT, where X is an amino acid or oligopeptide and the amino acid is seloected from a group including 6-aminohexanoic acid, 4-aminobenzoic acid and β-alanine and the oligopeptide is selected from a group including GlyGly, GlyPhe, GlyPheGly, GlyLeuGly, GlyPheLeuGly, Gly-DL-PheLeuGly, GlyLeuPheGly.

5. Reactive polymers according to Claim 3, characterized in that they consist of 20 - 150 monomer units linked in a polymer chain composed of 100 % *N*-(2-hydroxypropyl)methacrylamide units and bearing (3-sulfanylpropanoyl)-thiazolidine-2-thione grouping at the chain end.

6. Reactive polymers according to Claim 5, characterized in that they consist of 20 - 150 monomer units linked in a polymer chain composed of 95-99.9 % *N*-(2-hydroxypropyl)methacrylamide units and 0.1 – 5 % *N*-methacryloylated oligopeptides of doxorubicinu, where oligopeptides are selected from a group including GlyPheGly, GlyLeuGly, Gly-DL-PheLeuGly, GlyPheLeuGly, GlyLeuPheGly and GlyLeuLeuGly, and bearing (3-sulfanylpropanoyl)-thiazolidine-2-thione grouping at the chain end.

7. Reactive polymers according to Claim 3, characterized in that they consist of 20 - 2000 monomer units linked in a polymer chain composed of 100 % *N*-(2-hydroxypropyl)methacrylamide units and bearing (4-cyanopentanoyl)-thiazolidine-2-thione group at the chain end.

8. Reactive polymers according to Claim 7, characterized in that they consist of 20 – 2000 monomer units linked in a polymer chain composed of 95-99.9 % *N*-(2-hydroxypropyl)methacrylamide units and 0.1 – 5 % *N*-methacryloylated oligopeptides of doxorubicinu, where oligopeptides are selected from a group including GlyPheGly, GlyLeuGly, Gly-DL-PheLeuGly, GlyPheLeuGly, GlyLeuPheGly and GlyLeuLeuGly, and bearing (4-cyanopentanoyl)thiazolidine-2-thione group at the chain end.

9. Reactive monomer units based on *N*-methacryloylated amino acids or oligopeptides for preparation of polymers according to Claim 4, characterized in that they consist of *N*-methacryloylated amino acids or oligopeptides containing reactive thiazolidine-2-thione groups of the general formula Ma-X-TT, where X is an amino acid or oligopeptide and the amino acid is selected from a group including 6-aminohexanoic acid, 4-aminobenzoic acid and β-alanine and the oligopeptide is selected from a group including GlyGly, GlyPhe, GlyPheGly, GlyLeuGly, GlyPheLeuGly, Gly-DL-PheLeuGly, GlyLeuPheGly and TT is a reactive thiazolidine-2-thione group.

10. Method of preparation of reactive polymers and copolymers according to Claim 1 characterized in that the monomers selected from the group consisting of *N*-(2-hydroxypropyl)methacrylamide and *N*-methacryloylated amino acid or oligopeptide containing reactive thiazolidine-2-thione groups are subjected to radical copolymerization in solution.

11. Method of preparation of reactive polymers and copolymers according to Claim 1 characterized in that the monomer *N*-(2-hydroxypropyl)methacrylamide is subjected to precipitation radical polymerization in the presence of 3-sulfanylpropanoic acid as chain carrier or 2,2'-azobis(4-cyanopentanoic acid) as initiator and the obtained polymer is reacted with 4,5-dihydrothiazole-2-thiol.

12. Method of preparation of reactive polymers and copolymers according to Claims 6 or 8 characterized in that the monomer *N*-(2-hydroxypropyl)methacrylamide is subjected to solution radical copolymerization with a *N*-methacryloylated oligopeptide of doxorubicine in the presence of 3-sulfanylpropanoic acid as chain carrier or 2,2'-azobis(4-cyanopentanoic acid) as initiator and the obtained polymer is reacted with 4,5-dihydrothiazole-2-thiol.

13. The use of reactive polymers according to Claim 1 for preparation of polymer conjugates containing a drug such as doxorubicin and daunomycin.

14. The use of reactive copolymers according to Claim 1 for preparation of polymer conjugates containing a protein such as IgG, hIgG and monoclonal antibody.

15. The use of reactive polymers according to Claim 1 for preparation of hydrophilic-polymer-modified ("coated") polymer complexes (polyplexes) of DNA plasmids or adenoviruses as gene delivery systems.